

Remarks

Claims 1-67 are pending in this application. Applicants have amended claims 1-18, 22-50, and 54-66 to clarify the claimed invention.

The Examiner rejected claims 1-67 under 35 U.S.C. § 112, second paragraph, as indefinite. Applicants have amended the claims to recite “automatically, using image processing software” as described in the specification to clarify that the method carries out certain steps automatically as opposed to manually. In particular, the specification describes this at paragraphs 0035, 0038, 0039, 0041, and 0044 of the published application. Accordingly, Applicants submit that all pending claims comply with 35 U.S.C. § 112, second paragraph, and respectfully request withdrawal of this rejection.

The Examiner rejected claims 1-66 under 35 U.S.C. § 102(e) as being anticipated by U.S. patent 6,892,089 to Prince et al. The Examiner rejected claim 67 under 35 U.S.C. § 103(a) as being unpatentable over Prince et al. in view of U.S. patent publication 2003/0045803 to Acharya.

Prince et al. does not disclose the invention recited in claims 1-66 since, among other things, Prince et al. does not disclose definition of a reference point and measurement points during image analysis of a previously obtained dynamic sequence of medical images. Applicants would like to bring to the Examiner's attention that the description of Prince et al. contains two major parts as described at col. 5, lines 41-49. That is, the description of Prince et al. includes

description of: a) an image construction technique that includes changing magnetic properties in a pattern across an examined body part during the magnetic resonance scanning, and b) subsequent analysis of the previously obtained images. The image construction technique is not related to analysis of a previously obtained sequence of images as recited in the claims.

The Examiner asserts that Prince et al. discloses the definition of reference points and measurement points in col. 6-10. However, these passages relate to image construction rather than image analysis of previously obtained images. Thus, these passages do not disclose definition of a reference point and measurement points during image analysis of a previously obtained dynamic sequence of medical images.

Additionally, regarding analysis of previously obtained images, Prince et al. does not disclose the use of a reference point that is fixed in relation to an image geometry, as recited in the claims. Rather, Prince et al. discloses image analysis based on multiple measurement points. For example, col. 17, line 67, through col. 18, line 4, describes two defined points both within the moving myocardium, or left ventricular wall. Thus, neither of these points is a fixed reference point. Additionally, col. 18, lines 18-33, describes the definition of 48 points within a moving heart, none of which is used as a fixed reference point. Therefore, Prince et al. does not disclose the use of an explicit reference point that is fixed in relation to an image geometry across the sequence.

On the other hand, the claimed invention includes defining at least one measurement point and a reference point in a dynamic sequence of medical images of a moving body part.

The reference point may be set to a point that is fixed in relation to the image geometry. That is, the reference point may be set to a point that is not essentially moved during movement of the moving body part. The at least one measurement point may be tracked in all of the images using image processing software. The reference point may be indicated in all of the images using image processing software.

Thus, according to the claimed invention, at least one measurement point of a moving body part may be automatically tracked in a dynamic sequence of images of the moving body part. That is, the at least one measurement point may be automatically tracked utilizing image processing software.

A length and a direction of at least one vector extending from the reference point to one of the at least one measurement point for each pair of reference point and one measurement point may be determined in all of the images automatically using image processing software. In addition, at least one of a rate of change of the length and the direction of the at least one vector between selected images may be determined automatically using image processing software.

The use of a reference point brings substantial additional value to measurements of dynamic sequences. Without a reference point, it is not possible to measure an overall motion of a measurement point, but only the motion relative to other moving areas. Thus, the measurement point may have a large movement during the dynamic sequence that is not recognized if a reference point is not used. As the study of, for instance, heart malfunction requires extensive understanding of the dynamic behaviour of the heart muscle, the additional information available

through the use of reference points is potentially very important to ensure a correct diagnosis and a correct subsequent treatment.

In view of the above, Prince et al. does not disclose all elements of the invention recited in claims 1-66. Since Prince et al. does not disclose all elements of the invention recited in claims 1-66, the invention recited in claims 1-66 is not properly rejected under 35 U.S.C. § 102(b). For an anticipation rejection under 35 U.S.C. § 102(b) no difference may exist between the claimed invention and the reference disclosure. *See Scripps Clinic and Research Foundation v. Genentech, Inc.*, 18 U.S.P.Q. 841 (C.A.F.C. 1984).

Along these lines, anticipation requires the disclosure, in a cited reference, of each and every recitation, as set forth in the claims. *See Hodosh v. Block Drug Co.*, 229 U.S.P.Q. 182 (Fed. Cir. 1986); *Titanium Metals Corp. v. Banner*, 227 U.S.P.Q. 773 (Fed. Cir. 1985); *Orthokinetics, Inc. v. Safety Travel Chairs, Inc.*, 1 U.S.P.Q.2d 1081 (Fed. Cir. 1986); and *Akzo N.V. v. U.S. International Trade Commissioner*, 1 U.S.P.Q.2d 1081 (Fed. Cir. 1986).

The combination of Prince et al. and Acharya does not suggest the invention recited in claim 67 since, among other things, Acharya does not overcome the above-described deficiencies of Prince et al. Along these lines, Acharya does not suggest analysis of a sequence of images or the use of a reference point that is fixed in relation to an image geometry. The Examiner only cites Acharya as suggesting a specific type of imaging apparatus. Even if Acharya did suggest the claimed imaging apparatus, Acharya does not suggest the elements of the claimed invention

not suggested by Prince et al. Therefore, the combination of Prince et al. and Acharya does not suggest the invention recited in claim 67.

In view of the above, the references relied upon in the office action, whether considered alone or in combination, do not disclose or suggest patentable features of the claimed invention. Therefore, the references relied upon in the office action, whether considered alone or in combination, do not anticipate the claimed invention or make the claimed invention obvious. Accordingly, Applicants request withdrawal of the rejections based upon the cited references.

In conclusion, Applicants respectfully request favorable reconsideration of this case and early issuance of the Notice of Allowance.

If an interview would advance the prosecution of this application, Applicants respectfully urge the Examiner to contact the undersigned at the telephone number listed below.

The undersigned authorizes the Commissioner to charge fee insufficiency and credit overpayment associated with this communication to Deposit Account No. 22-0261.

Respectfully submitted,

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